



[6450-01-P]

DEPARTMENT OF ENERGY

National Nuclear Security Administration

Excess Uranium Management: Secretarial Determination of No Adverse Impact on the Domestic Uranium Mining, Conversion, and Enrichment Industries

AGENCY: National Nuclear Security Administration, Department of Energy

ACTION: Notice.

SUMMARY: On August 2, 2015, the Secretary of Energy issued a determination (“Secretarial Determination”) covering the sale or transfer of high-assay low enriched uranium for medical isotope development projects. The Secretarial Determination covers transfers of up to 25 kilograms uranium (kgU) per year of low enriched uranium (LEU) at up to 19.75 percent uranium-235 for transfers in the two years following approval of the determination to support molybdenum-99 producers in commercial research and isotope production applications. For the reasons set forth in the Department’s “Analysis of Potential Impacts of Uranium Transfers on the Domestic Uranium Mining, Conversion, and Enrichment Industries,” which is incorporated into the determination, the Secretary

determined that these transfers will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industry.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION: The Department of Energy (DOE) holds inventories of uranium in various forms and quantities—including low-enriched uranium (LEU) and natural uranium—that have been declared as excess and are not dedicated to U.S. national security missions. Within DOE, the Office of Nuclear Energy (NE), the Office of Environmental Management (EM), and the National Nuclear Security Administration (NNSA) coordinate the management of these excess uranium inventories. NNSA down-blends excess highly-enriched uranium to high-assay low-enriched uranium—above the commercial level of 5 wt-% and up to about 19.75 wt-% of the isotope U-235—in support of its nonproliferation objectives and missions. Common applications of such high-assay materials are as fuels for domestic and foreign research reactors and as target materials for the production of medical isotopes.

This notice involves high-assay LEU transfers of this type to support molybdenum-99 producers in either and/or both of the above applications. These transfers fulfill a directive in the American Medical Isotope Production Act of 2012 (Pub. L. 112–239, Division C, Title XXXI, Subtitle F, 42 U.S.C. § 2065) for the Department to

carry out a program of assistance for the development of fuels, targets, and processes for domestic molybdenum-99 production that do not use highly enriched uranium. These transfers also support U.S. nuclear nonproliferation initiatives, by providing a path for down-blended highly enriched uranium (HEU) and encouraging the use of LEU in civil applications in lieu of HEU.

These transfers are conducted in accordance with the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq., “AEA”) and other applicable law. Specifically, Title I, Chapters 6, 14, of the AEA authorize DOE to transfer special nuclear material; LEU is a type of special nuclear material. The USEC Privatization Act (Pub. L. 104-134, 42 U.S.C. 2297h et seq.) places certain limitations on DOE’s authority to transfer uranium from its excess uranium inventory. Specifically, under section 3112(d)(2)(B) of the USEC Privatization Act (42 U.S.C. 2297h-10(d)(2)(B)), the Secretary must determine that the transfers “will not have an adverse material impact on the domestic uranium mining, conversion or enrichment industry, taking into account the sales of uranium under the Russian Highly Enriched Uranium Agreement and the Suspension Agreement” before DOE makes certain transfers of natural or low-enriched uranium under the AEA.

On August 2, 2015, the Secretary of Energy issued a determination (“Secretarial Determination”) covering the sale or transfer of high-assay low enriched uranium for medical isotope development projects. The Secretarial Determination covers transfers of up to 25 kilograms per year of LEU at up to 19.75 percent uranium-235 for transfers in the two years following approval of the determination to support molybdenum-99 producers in commercial research and isotope production applications. The Secretary based his conclusion on the Department’s “Analysis of Potential Impacts of Uranium

Transfers on the Domestic Uranium Mining, Conversion, and Enrichment Industries,” which is incorporated into the determination. The Secretary considered, *inter alia*, the requirements of the USEC Privatization Act of 1996 (42 U.S.C. § 2297h et seq.), the nature of uranium markets, and the current status of the domestic uranium industries, as well as sales of uranium under the Russian HEU Agreement and the Suspension Agreement.

Issued in Washington, DC.

Anne M. Harrington,
Deputy Administrator for Defense Nuclear Nonproliferation,
National Nuclear Security Administration

Set forth below is the full text of the Secretarial Determination.

SECRETARIAL DETERMINATION FOR THE SALE OR TRANSFER OF
URANIUM

I determine that the transfer of up to the equivalent of 25 kgU of 19.75%-assay low enriched uranium per calendar year to support the development and demonstration of molybdenum-99 production capabilities will not have an adverse material impact on the domestic mining, conversion, or enrichment industry. I base my conclusions on the Department's "Analysis of Potential Impacts of Uranium Transfers on the Domestic Uranium Mining, Conversion, and Enrichment Industries," which is incorporated herein. As explained in that document, I have considered, inter alia, the requirements of the USEC Privatization Act of 1996 (42 U.S.C. § 2297h et seq.), the nature of uranium markets, and the current status of the domestic uranium industries. I have also taken into account the sales of uranium under the Russian HEU Agreement and the Suspension Agreement.

Date: August 2, 2015.

Ernest J. Moniz,

Secretary of Energy

Analysis of Potential Impacts of Uranium Transfers on the Domestic Uranium Mining, Conversion, and Enrichment Industries

I. Introduction

A. Legal Authority

DOE manages its excess uranium inventory in accordance with the Atomic Energy Act of 1954 (42 U.S.C. § 2011 et seq., “AEA”) and related statutes. Specifically, Title I, Chapters 6–7, 14, of the AEA authorize DOE to transfer special nuclear material and source material. LEU and natural uranium are types of special nuclear material and source material, respectively.

The USEC Privatization Act (Pub. L. 104-134, 42 U.S.C. § 2297h et seq.) places certain limitations on DOE’s authority to transfer uranium from its excess uranium inventory.

Specifically, under section 3112(d) of the USEC Privatization Act (42 U.S.C.

§ 2297h-10(d)), DOE may make certain transfers of natural or low-enriched uranium if the Secretary determines that the transfers “will not have an adverse material impact on the domestic uranium mining, conversion or enrichment industry, taking into account the sales of uranium under the Russian Highly Enriched Uranium Agreement and the Suspension Agreement.” (42 U.S.C. § 2297h-10(d)(2)(B)). The validity of any determination under this section is limited to no more than two calendar years subsequent

to the determination (see Section 306(a) of Division D, Title III of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235)).

B. Transfers considered in this determination

The American Medical Isotopes Production Act of 2012 (Pub. L. 112–239, Division C, Title XXXI, Subtitle F, 42 U.S.C. § 2065) directs the Department to carry out a program to provide assistance for the development of fuels, targets, and processes for domestic molybdenum-99 production that do not use highly enriched uranium (HEU). The transfer of small quantities of high-assay low enriched uranium (LEU) (LEU enriched above 5 wt-%, but below 20 wt-% U-235) is appropriate and necessary to assist parties engaged in research and development (R&D) and commercial demonstrations of the aforementioned fuels, targets, and processes. Material transfers under this determination will occur primarily during calendar years 2015 and 2016 and consist of no more than 25 kgU of material enriched at up to 19.75 wt-% of the isotope U-235 in any calendar year.¹ Assuming a tails assay of 0.20 wt-% U-235, it would require approximately 1 MTU of natural uranium hexafluoride and approximately 1,100 separative work units (“SWU”) to produce that quantity of 19.75 wt-% LEU.

II. Analytical Approach

Consistent with the analytical approach outlined in the Department’s prior Analysis of Potential Impacts of Uranium Transfers, 80 Fed. Reg. 26,366, 26,379-84 (May 7, 2015),

¹ If any transfers include material at an assay other than 19.75 wt-%, the amount will be converted so that the total amount in any calendar year is equivalent to no more than 25 kgU at 19.75 wt-%.

this analysis evaluates two forecasts: one reflecting the state of the domestic uranium industries if DOE goes forward with the transfer and one reflecting the state of the domestic uranium industries if DOE does not go forward with the transfer. DOE compares these two forecasts to determine the relevant impacts on the domestic uranium industries. In conducting this comparison, DOE has developed a set of factors that this analysis considers in assessing whether DOE's uranium transfers will have an "adverse material impact" on the domestic uranium mining, conversion, or enrichment industries:

1. Prices
2. Production at existing facilities
3. Employment levels in the industry
4. Changes in capital improvement plans and development of future facilities
5. Long-term viability and health of the industry
6. Russian HEU Agreement and Suspension Agreement

While no single factor is dispositive of the issue, DOE believes that these factors are representative of the types of impacts that the proposed transfers may have on the domestic uranium industries. Not every factor will necessarily be relevant on a given occasion or to a particular industry; DOE intends this list of factors only as a guide to its analysis.

III. Assessment of Potential Impacts

There is currently no domestic commercial supplier of high-assay LEU. In particular, with the closing of the Paducah Gaseous Diffusion Plant in 2013, the only remaining operational uranium enrichment facility in the U.S. is that operated by Louisiana Energy

Services, LLC, which is licensed by the Nuclear Regulatory Commission to possess LEU only up to 5 wt-% U-235,² meaning no domestic commercial uranium enrichment facility is currently licensed to possess the high-assay LEU contemplated for transfer.

Modern enrichment facilities are technologically able to produce such materials; however, due to the economics of enrichment, owners and operators of such enrichment facilities have thus far chosen not to pursue enrichment of high-assay LEU. To produce such LEU, a commercial supplier would need to secure an appropriate license or license amendment, a task that would require an investment of money and time. Projections of demand in the nuclear medicine industry lead to the forecast that the need for high-assay LEU in future years will range from tens to hundreds of kilograms. Compared to the thousands of metric tons of enriched uranium required by the commercial power industry, and given the costs required for licensing, the production of such small quantities of high-assay materials is not likely to be economically viable for private industry.

There also does not exist currently a foreign commercial producer or supplier of high-assay low enriched uranium for use in domestic research reactors or medical isotope production applications; what high-assay LEU is produced internationally, for example to convert Russian-supplied reactors from highly enriched uranium (HEU) cores, is produced by a state-owned enterprise for official purposes via down-blending excess HEU.

² U.S. Nuclear Regulatory Commission, *Materials License*. License Number SNM-2010, Amendment 57, Docket Number 70-3103

Given the specialized uses, designs, and regulatory requirements of the fuels and targets used for these isotope production purposes, it is not feasible to replace the DOE-sourced high-assay LEU used in research reactor fuel or targets with commercial-assay LEU because fuel or targets fabricated from commercial-assay LEU would generally not serve the intended purposes.

Given the lack of commercial production or supply of such materials, an analysis of the impact of transfers based on an assessment of the six factors listed in Section II is straightforward: since the transfer of DOE material would not displace primary production of uranium concentrates, conversion services, or enrichment services, there is no impact on the domestic uranium industries with respect to any of the factors.

Even if the DOE transfers would displace production among the domestic uranium mining, conversion, or enrichment industries, the amount is so small that the effects would be de minimis. With respect to the three uranium industries, in order to produce the amount of LEU in DOE transfers from primary production, it would require about 2500 pounds of uranium concentrates, 950 kgU of conversion services, and approximately 1,100 SWU of enrichment services. By comparison, the entire global fleet of nuclear reactors is expected to need in 2015 approximately 160 million pounds U_3O_8 , 56 million kgU of conversion services, and about 45 million SWU.³ For further

³ These estimates of global requirements come from an analysis prepared by Energy Resources International, Inc. (ERI), dated February 20, 2015. This report is available at <http://www.energy.gov/ne/downloads/excess-uranium-management>. DOE tasked ERI to prepare this analysis to assess the potential effects on the domestic uranium mining, conversion, and enrichment industries of the introduction into the market of uranium transfers that are not the subject of this assessment. ERI develops its requirements forecasts for various customers. Because of ERI's general

comparison, the U.S. uranium mining industry produced approximately 4.9 million pounds of U_3O_8 in 2014.⁴ The domestic conversion industry consists of only one facility. In recent years, that facility has produced between 11 and 12 million kgU. As mentioned above, there is only one currently operating enrichment facility in the U.S. The total capacity of that facility is currently about 3.7 million SWU.

Given how small DOE transfers are compared to either global reactor requirements or domestic production, DOE concludes that transfers at this level would have almost no impact on the domestic uranium mining, conversion, or enrichment industries with respect to any of the six factors listed in Section II.

DOE recently issued a determination that certain transfers of natural uranium in exchange for cleanup services at the Portsmouth Gaseous Diffusion Plant and of LEU in exchange for downblending services will not have an adverse material impact on the domestic uranium industries. The analysis supporting that determination also considered various other past transfers, the uranium from which may still be affecting markets. 80 Fed. Reg. at 26,385. In reaching the conclusion that transfers of up to 25 kg per year of high-assay LEU will have at most de minimis impacts on the domestic uranium industries, DOE takes account of the various transfers assessed for its recent determination.

IV. Conclusion

expertise in the uranium markets and contacts with market participants, DOE believes ERI's general market information is reliable.

⁴ EIA, Domestic Uranium Production Report Q4 2014, 2 (January 2015).

For the reasons discussed above, these transfers will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industry taking into account sales under the Russian HEU Agreement and Suspension Agreement.

[FR Doc. 2015-27303 Filed: 10/26/2015 08:45 am; Publication Date: 10/27/2015]